

CLAIMS

What is claimed is:

1. A film comprising a polyethylene composition possessing a density of between 0.940 and 0.970 g/cm³, and an I₂₁ value of from 4 to 20 dg/min; characterized in that the polyethylene composition extrudes at a melt temperature, T_m, that satisfies the following relationship:

$$T_m \leq 235 - 3.3 (I_{21})$$

wherein the polyethylene composition is extruded at a specific throughput of from 1 to 1.5 lbs/hr/inch; and wherein the polyethylene composition formed into a film has a gel count of less than 100.

2. A film comprising a polyethylene composition possessing a density of between 0.940 and 0.970 g/cm³, and an I₂₁ value of from 4 to 20 dg/min; characterized in that the polyethylene composition extrudes at a melt temperature that is from 2 to 20°C less than multi-reactor polyethylene compositions possessing a density of between 0.940 and 0.970 g/cm³ and an I₂₁ value of from 4 to 20 dg/min extruded under the same conditions; further characterized in that the film has a gel count of less than 100.
3. A film comprising a polyethylene composition, the polyethylene composition comprising a high molecular weight component having a weight average molecular weight of greater than 50,000 amu and a low molecular weight component having a weight average molecular weight of less than 50,000 amu; the polyethylene composition possessing a density of between 0.940 and 0.970 g/cm³, and an I₂₁ value of less than 20 dg/min and a Mw/Mn value of from greater than 35; characterized in that the film has a gel count of less than 100.
4. The film of Claim 1, 2 or 3, wherein the polyethylene composition comprising a high molecular weight component having a weight average molecular weight of

greater than 50,000 amu and a low molecular weight component having a weight average molecular weight of less than 40,000 amu.

5. The film of Claim 4, wherein the low molecular weight component possesses a weight average molecular weight of less than 30,000 amu.
6. The film of Claim 4, wherein the low molecular weight component has a weight average molecular weight of less than 20,000 amu.
7. The film of Claim 4, wherein the low molecular weight component has a weight average molecular weight of less than 15,000 amu.
8. The film of Claim 1 or 2, wherein the polyethylene composition has an M_w/M_n value of from greater than 35.
9. The film of Claim 1, 2 or 3, wherein the polyethylene composition has an M_w/M_n value of from greater than 40.
10. The film of Claim 1, 2 or 3, wherein the polyethylene composition has an elasticity of greater than 0.60.
11. The film of Claim 1, 2 or 3, wherein the polyethylene composition is free of hard foulants.
12. The film of Claim 1 or 2, wherein the polyethylene composition extrudes at a specific throughput of from 1 to 1.4 lbs/hr/inch.
13. The film of Claim 1 or 2, wherein the polyethylene composition extrudes at a specific throughput of from 1 to 1.3 lbs/hr/inch.
14. The film of Claim 1, 2 or 3, wherein the film is produced by the steps comprising:

- (a) first forming a polyethylene composition comprising incorporating the high molecular weight polymer into the low molecular weight polymer formed by contacting ethylene and C₃ to C₁₂ α -olefins, an alkylaluminum, water, and a bimetallic catalyst composition; followed by
 - (b) extruding the polyethylene composition to form pellets while optionally adding oxygen, to form pellets of polyethylene composition;
 - (c) isolating pellets of polyethylene composition;
 - (d) extruding the polyethylene composition in an extruder to form a film.
15. The film of Claim 14, wherein from 0.01 to 14 SCFM of oxygen is added to the polyethylene composition during step (b).
16. The film of Claim 1, 2, 3, wherein the polyethylene composition is produced in a single continuous gas phase reactor process.
17. The film of Claim 1 or 2, and wherein the film has a gel count of less than 50.
18. The film of Claim 1, 2 or 3, wherein the weight percent of the high molecular weight component is greater than 50 wt% relative to the total polyethylene composition as measured by GPC.
19. The film of Claim 1, 2 or 3, wherein the weight percent of the high molecular weight component ranges from 50 to 80 wt% relative to the total polyethylene composition as measured by GPC.
20. The film of Claim 1, 2 or 3, wherein the polyethylene composition comprises poly(ethylene-*co*-1-butene).
21. The film of Claim 1, 2 or 3, wherein the polyethylene composition is extruded using a motor load of less than 80 % the maximum motor load.